Documentation of Environmental Indicator Determination
Interim Final 2/5/99
RCRA Corrective Action
Environmental Indicator (EI) RCRA Info code (CA725)
Current Human Exposures Under Control

Facility Name: Griffin Pipe Products Company
Facility Address: 10 Adams Street, Lynchburg, Virginia 24504
Facility EPA ID #: VAD065417008

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

   ✓ If yes - check here and continue with #2 below.

   _____ If no - re-evaluate existing data, or

   _____ If data are not available skip to #6 and enter "IN" (more information needed) status code.

BACKGROUND

Definition of Environmental Indicators (for the RCRA Corrective Action)

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

Definition of "Current Human Exposures Under Control" EI

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

Relationship of EI to Final Remedies

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors).

Duration / Applicability of EI Determinations

EI Determinations status codes should remain in RCRA Info as long as they remain true (i.e., in RCRA Info status codes must be changed when the regulatory authorities become aware of contrary information).

Rationale and Reference(s):

The Griffin Pipe Products (GPP) facility is located on an approximately 11-acre property in the northeastern portion of the City of Lynchburg, along the western bank of the James River. The facility is located on relatively level ground within the James River floodplain. The site is bounded on the north and east by the James River. The site is bordered to the west by a railroad yard and a bluff which rises out of the floodplain. The southern portion of the site is ultimately bounded by Blackwater Creek. The majority of the site is paved or covered by buildings. A small canal runs through the site and under several of the buildings.

The GPP Foundry has been manufacturing ductile cast iron pipes for use in both potable water and sewer systems. The process involves high temperature melting and painting.

Over the last 18 years, groundwater monitoring wells have been installed at the site for a variety of investigative and monitoring purposes.

During the August 1990 site characterization required for a petroleum release (PC #1990-0587), eight monitoring wells (MW-1 through MW-8) were installed west of the engineering building in order to delineate the extent of contamination due to the documented release of gasoline from a 3,000-gallon gasoline UST and suspected waste oil tank. These wells are believed to have been intentionally abandoned following closure of the PC number in a letter from the VDEQ dated August 30, 2002.

During the 1993 site characterization required for a second petroleum release (PC #1991-0122), twelve monitoring wells (MW-9 through MW-20) were installed at the site in order to delineate the extent of contamination due to a suspected release of fuel oil, waste oil, or other petroleum products near the lunchroom area. Results of the investigation identified an area of LNAPL in groundwater which was apparently derived from the abandoned underground pipeline associated with the 22,500-gallon fuel oil AST on the western side of the foundry building. Seven additional monitoring wells (MW-21 through MW-27) and three temporary monitoring wells (MW-28 through MW-30) were installed at the site from 1993 to 2002 in order to further delineate the plume. Three product recovery wells (RW-2, RW-3, and RW-4) were installed at the site in 2003 in association with PC #1991-0122 as well. Under this project, a Corrective Action Plan (CAP) was developed in 1998, with an Addendum Addition added in Dec. 2002. Corrective action is ongoing under DEQ's Tank Program.

A non-potable well that is sometimes used in production is also located outside of the northeastern corner of the main foundry building.

Based on the available information, including written facility records, historical environmental investigations, and interviews with facility personnel, 29 SWMUs and 44 AOCs have been identified on the site in the Phase I, RFI work plan, dated May 2008. The facility proposed that seven (7) SWMUs/AOCs, namely SWMUs 9, 10, 12 and 13 and AOCs 1, 2 and 15, will be investigated during the upcoming Phase I RCRA Facility Investigation (RFI) and that at least eleven (11) wells, including eight (8) existing wells, two (2) newly installed wells and one (1) non-potable well, will be used to evaluate site-wide groundwater quality. Following the approval of the Phase I RFI work plan and submittal of the Phase I RFI report, groundwater quality will be further evaluated to determine the nature and extent of groundwater contamination on site. A SWMU/AOC Location Map is provided in Figure 1.

References:

Phase I RCRA Facility Investigation (RFI) Workplan (May 2008) for Griffin Pipe Products Company

Footnotes: [1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate "levels" (appropriate for the protection of the groundwater resource and its beneficial uses).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be **"contaminated"**[1] above appropriately protective risk-based "levels" (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

	Yes	No	?	Rationale / Key Contaminants
Groundwater	✓			Possible Metals, VOCs, SVOCs, and PCB
Air (indoors)[2]			✓	Possible VOCs
Surface Soil (<2 ft)			✓	Possible Metals, VOCs, SVOCs, and PCB
Surface Water	✓			Possible VOCs and SVOCs
Sediment			✓	Possible Metals, VOCs, SVOCs, and PCB
Subsurf. Soil (>2 ft)	✓			Possible Metals, VOCs, SVOCs, and PCB
Air (outdoors)			✓	Possible VOCs

_____ If no (for all media) - skip to #6, and enter "YE," status code after providing or citing appropriate "levels," and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

__✓__ If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

_____ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):
See attached page

("Unknowns" are carried through with "Yes" determinations to ascertain what information is needed or if risks are negligible.)

Footnotes:

[1] "Contamination" and "contaminated" describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based "levels" (for the media, that identify risks within the acceptable risk range).

[2] Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggest that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

CA 725
Section 2 attachment – Rationale and References

1. **Groundwater** – YES
   REFERENCE: 1) *Phase I RCRA Facility Investigation (RFI) Work Plan, dated May 2008.*

   RATIONALE: Based on the available information, including written facility records, historical environmental investigations, and interviews with facility personnel, 29 Solid Waste Management Units (SWMUs) and 44 Areas of Concern (AOCs) have been identified on the site. The facility proposes that seven (7) SWMUs/AOCs, namely SWMUs 9, 10, 12 and 13 and AOCs 1, 2 and 15, will be investigated during the upcoming Phase I RFI and that at least eleven (11) wells, including eight (8) existing wells, two (2) newly installed wells and one (1) non-potable well, will be used to evaluate site-wide groundwater quality. Following the Phase I RFI, site-wide groundwater quality will be further evaluated to determine the extent of contaminated groundwater.

   Note: The Department of Environmental Quality's (the Department) technical review comments on the Phase I RFI Work Plan, were sent to the facility on August 8, 2008. A revised RFI Work Plan submittal was requested by the Department. Following the approval of the Phase I RFI Work Plan and submittal of the Phase I RFI Report, the groundwater quality will be further evaluated to determine the nature and extent of groundwater contamination onsite.

2. **Air (indoors)** – UNKNOWN
   REFERENCE: 1) *Phase I RFI Work Plan, dated May 2008.*

   RATIONALE: The extent of the impact of the VOCs from contaminated groundwater at the site is unknown and will be evaluated as part of the Phase I RFI. The workers in the work environments are protected under the OSHA standards; therefore, it can reasonably be assumed that the indoor air does not pose a risk above acceptable OSHA standards.

3. **Surface Soil** – UNKNOWN
   REFERENCE: 1) *Phase I RFI Work Plan, dated May 2008.*

   RATIONALE: Based on the available information, including written facility records, historical environmental investigations, and interviews with facility personnel, 29 Solid Waste Management Units (SWMUs) and 44 Areas of Concern (AOCs) have been identified on the site. The facility proposes that a total of five (5) SWMUs/AOCs, namely SWMU-10 and SWMU-13 and AOC-1, AOC-2, and AOC-15 will be investigated during the upcoming Phase I RFI. Each location would be sampled and analyzed for Inorganic Metals, VOCs, SVOCs, Total Sulfide, and Total Cyanide, as outlined in the RFI Work Plan. SWMU-10, AOC-1, and AOC-2 would also be sampled and analyzed for PCBs. Due to the nature of the wastes contained in the SWMUs, the facility anticipates that soil contamination, if it exists, should occur at shallow depths.

   Note: The Department's technical review comments on the Phase I RFI Work Plan, were sent to the facility on August 8, 2008. A revised RFI Work Plan submittal was requested by the Department. Following the approval of the Phase I RFI Work Plan and submittal of the Phase I RFI Report, the surface soil quality will be further evaluated to determine the nature and extent of surface soil contamination onsite.

4. **Surface Water** – YES
   REFERENCE: 1) *Phase I RFI Work Plan, dated May 2008.*

   RATIONALE: The facility historically discharged wastewater to the James River under NPDES Permit No. VA0002925. The permit was reissued in May 1991 as a VPDES permit by the Virginia State Pollution Control Board (VSWPCB). The current permit (effective September 25, 2006) regulates discharges from four (4) outfalls: 015, 016, 017, and 025 for stormwater. The facility was issued a General VPDES Permit for Discharges from Petroleum Contaminated Sites (VAG837002) on February 24, 1998 in relation to Pollution Complaint #1991-0122. The permit allowed for the discharge of groundwater from the free product recovery system at the site (Outfall 001). Following submittal of a completed Registration Statement on February 24, 2003, GPP was granted renewal of the permit until February 25, 2008.

In February 2003, the Department granted approval of a Corrective Action Plan (CAP) Addendum to address groundwater and surface water monitoring and product recovery efforts associated with Pollution Complaint #1991-0122. Due to problems with the free product recovery system and the need for additional investigation, a revised CAP is being proposed to the Department's Tank Program for approval. Based on this information surface water should continue to be monitored and evaluated until the revised CAP is initiated.

5. Sediment – UNKNOWN

REFERENCE: 1) *Phase I RFI Work Plan, dated May 2008.*

RATIONALE: Based on the available information, including written facility records, historical environmental investigations, and interviews with facility personnel, 29 Solid Waste Management Units (SWMUs) and 44 Areas of Concern (AOCs) have been identified on the site. The facility proposes that a total of five (5) SWMUs/AOCs, namely SWMU-10 and SWMU-13 and AOC-1, AOC-2, and AOC-15 will be investigated during the upcoming Phase I RFI. Each location would be sampled and analyzed for Inorganic Metals, VOCs, SVOCs, Total Sulfide, and Total Cyanide, as outlined in the RFI Work Plan. SWMU-10, AOC-1, and AOC-2 would also be sampled and analyzed for PCBs. Due to the nature of the wastes contained in the SWMUs, the facility anticipates that soil contamination, if it exists, should occur at shallow depths.

Note: The Department's technical review comments on the Phase I RFI Work Plan, were sent to the facility on August 8, 2008. A revised RFI Work Plan submittal was requested by the Department. Following the approval of the Phase I RFI Work Plan and submittal of the Phase I RFI Report, the sediment quality will be further evaluated to determine the nature and extent of sediment contamination onsite.

6. Subsurface Soil – YES

REFERENCE: 1) *Phase I RFI Work Plan, dated May 2008.*

RATIONALE: Based on the available information, including written facility records, historical environmental investigations, and interviews with facility personnel, 29 Solid Waste Management Units (SWMUs) and 44 Areas of Concern (AOCs) have been identified on the site. The facility proposes that a total of five (5) SWMUs/AOCs, namely SWMU-10 and SWMU-13 and AOC-1, AOC-2, and AOC-15 will be investigated during the upcoming Phase I RFI. Each location would be sampled and analyzed for Inorganic Metals, VOCs, SVOCs, Total Sulfide, and Total Cyanide, as outlined in the RFI Work Plan. SWMU-10, AOC-1, and AOC-2 would also be sampled and analyzed for PCBs. In addition, soil contamination is likely to be present in the subsurface soil in the vicinity of the petroleum release associated with Pollution Complaint #1991-0122. Additional subsurface soil investigation is being recommended as part of the revised CAP being proposed to the Department's Tank Program for approval.

Note: The Department's technical review comments on the Phase I RFI Work Plan, were sent to the facility on August 8, 2008. A revised RFI Work Plan submittal was requested by the Department. Following the approval of the Phase I RFI Work Plan and submittal of the Phase I RFI Report, the subsurface soil will be further evaluated to determine the nature and extent of subsurface soil contamination onsite.

7. Air (outdoors) – UKNOWN

REFERENCE: 1) *Phase I RFI Work Plan, dated May 2008.*

RATIONALE: The facility is currently operating under a Title V Permit (Permit No. VA-30397) dated August 21, 2007, a State Operating Permit dated April 16, 2007, a New Source Review Permit dated April 27, 2005, and a New Source Review Permit dated June 21, 2004. The extent of the impact of the VOCs from contaminated groundwater at the site is unknown and will be evaluated as part of the Phase I RFI. In addition, the workers in the work environments are protected under the OSHA standards; therefore, it can reasonably be assumed that the outdoor air does not pose a risk above acceptable OSHA standards.

3. Are there **complete pathways** between "contamination" and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

Potential **Human Receptors** (Under Current Conditions)

Contaminated Media	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food[3]
Groundwater	NO	NO	NO	YES	NO	NO	NO
Air (indoors)	NO	YES	NO	YES	NO	NO	NO
Soil (surface, e.g., <2 ft)	NO	YES	NO	YES	NO	NO	NO
Surface Water	NO	YES	NO	YES	NO	NO	NO
Sediment	NO	YES	NO	YES	NO	NO	NO
Soil (subsurface e.g., >2 ft)	NO	NO	NO	YES	NO	NO	NO
Air (outdoors)	NO	YES	NO	YES	NO	NO	NO

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors' spaces for Media which are not "contaminated" as identified in #2 above.

2. enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("___"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

_____ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6, and enter "YE" status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

__✓__ If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) - continue after providing supporting explanation.

_____ If unknown (for any "Contaminated" Media - Human Receptor combination) - skip to #6 and enter "IN" status code.

Rationale and Reference(s):

Groundwater – see attached page, Item #1
Air (indoors) – see attached page, Item #2
Soil (surface) – see attached page, Item #3
Surface Water – see attached page, Item #4
Sediment – see attached page, Item #5
Soil (subsurface) – see attached page, Item #6
Air (outdoors) – see attached page, Item #7

[3] Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

1. Groundwater

REFERENCE: All available information within the Department files.

RATIONALE:

Residents

NO – There is no information indicating the presence of residents on the facility.

Workers

NO – The workers at the facility will not potentially be exposed to subsurface since workers do not get involved in excavation activities. The facility's water supply is provided by a public water supply (PWS) and no contact with contaminated groundwater typically occurs at the site.

Day-Care

NO – There is no information indicating the presence of a day-care on the facility.

Construction

YES – Construction workers at the facility may potentially be exposed to groundwater if construction activities required them to excavate down to the groundwater table (approximately 10-15 bgs). Construction activities would be covered by the facilities heath and safety plan. Currently, there are no planned construction activities at the facility therefore exposure to groundwater is considered to be under control.

Trespassers

NO – The facility is located in an industrial area with a fence surrounding the property thereby restricting access to trespassers.

Recreation

NO – There is no information indicating that any portion of the facility is for recreational use.

Food

NO – There is no information indicating that food is grown within the facility's boundary.

2. Air (indoors)

REFERENCE: All available information within the Department files.

RATIONALE:

Workers/Construction

YES – The extent of the impact of the VOCs from contaminated groundwater at the site is unknown and will be evaluated as part of the Phase I RFI. The workers in the work environments are protected under the OSHA standards; therefore, it can reasonably be assumed that the indoor air does not pose a risk above acceptable OSHA standards.

3. Soil (surface)

REFERENCE: All available information within the Department files.

RATIONALE:

Workers/Construction

YES – The workers at the facility may potentially be exposed to surface soils that may be high in contaminant concentrations in the vicinity of specific SWMUs and AOCs at the facility site. Most of the facility is paved or has concrete building floors and foundations which limit exposure. Construction activities would be covered by the facilities health and safety plan.

4. Surface Water

REFERENCE: All available information within the Department files.

RATIONALE:

Workers/Construction

YES – The workers at the facility may potentially be exposed to surface water that may be high in contaminant concentrations in the vicinity of specific SWMUs and AOCs at the facility site.

5. Sediment (surface)

REFERENCE: All available information within the Department files.

RATIONALE:

Workers/Construction

YES – The workers at the facility may potentially be exposed to sediment that may be high in contaminant concentrations in the vicinity of specific SWMUs and AOCs at the facility site.

6. Soil (subsurface)

REFERENCE: All available information within the Department files.

RATIONALE:

Construction

YES – Construction workers at the facility may potentially be exposed to subsurface soil if construction activities required them to excavate. Construction activities would be covered by the facilities heath and safety plan. Currently, there are no planned construction activities at the facility therefore exposure to subsurface soil is considered to be under control.

7. Air (outdoors)

REFERENCE: All available information within the Department files.

RATIONALE:

Workers/Construction

YES – The extent of the impact of the VOCs from contaminated groundwater at the site is unknown and will be evaluated as part of the Phase I RFI. The workers in the work environments are protected under the OSHA standards; therefore, it can reasonably be assumed that the outdoor air does not pose a risk above acceptable OSHA standards.

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **"significant"**[4] (i.e., potentially "unacceptable" because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable "levels" (used to identify the "contamination"); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable "levels") could result in greater than acceptable risks)?

_____ If no (exposures can not be reasonably expected to be significant (i.e., potentially "unacceptable") for any complete exposure pathway) - skip to #6 and enter "YE" status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to "contamination" (identified in #3) are not expected to be "significant."

_____ If yes (exposures could be reasonably expected to be "significant" (i.e., potentially "unacceptable") for any complete exposure pathway) - continue after providing a description (of each potentially "unacceptable" exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to "contamination" (identified in #3) are expected not to be "significant."

__✓__ If unknown (for any complete pathway) - skip to #6 and enter "IN" status code

Rationale and Reference(s):
The personnel in this work environment are protected under the OSHA standards. Exposure to contaminated groundwater, surface soils, surface water, sediment and subsurface soils is considered minimal since the facility operations do not routinely require personnel to be working in these areas. However, at this time, there is not enough information to determine the extent of contamination or the exposure to human health. The RFI Work Plan is currently in the review process. Once the RFI Work Plan is approved, the facility could then implement the RFI field work which would provide the information necessary to make a more accurate HHEI determination. The environmental data associated with SWMUs and AOCs will be provided in the Phase I RFI Report and based upon the investigation findings, the SWMUs and AOCs which pose a potential risk to human health and the environment will be further investigated, as needed, and a comprehensive risk assessment will be completed to establish corrective action remediation measures, which may be needed at the facility site under the RCRA.

Reference: *Phase I RFI Work Plan, dated May 2008*

[4] If there is any question on whether the identified exposures are "significant" (i.e., potentially "unacceptable") consult a human health Risk Assessment specialist with appropriate education, training and experience.

5. Can the "significant" **exposures** (identified in #4) be shown to be within **acceptable** limits?

_____ If yes (all "significant" exposures have been shown to be within acceptable limits) - continue and enter "YE" after summarizing and referencing documentation justifying why all "significant" exposures to "contamination" are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).

_____ If no (there are current exposures that can be reasonably expected to be "unacceptable")- continue and enter "NO" status code after providing a description of each potentially "unacceptable" exposure.

__✓__ If unknown (for any potentially "unacceptable" exposure) - continue and enter "IN" status code

Rationale and Reference(s):

6. Check the appropriate RCRA Info status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

_____ YE - Yes, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Griffin Pipe Product Company facility, EPA ID # VAD065417008, located Lynchburg, Virginia, under current and reasonably expected conditions. This determination will be re-evaluated when the Agency/State becomes aware of significant changes at the facility.

_____ NO - "Current Human Exposures" are NOT "Under Control."

✓ IN - More information is needed to make a determination.

Completed by Matthew M. Stepien Date 9-9-08
(print) Matthew M. Stepien
(title) Environmental Engineer Sr.

Supervisor Leslie A Romanchik Date 9/11/08
(print) Leslie A. Romanchik
(title) Director, Office of Hazardous Waste
(EPA Region or State) VA DEQ

Locations where References may be found:

VA Department of Environmental Quality, Office of Hazardous Waste

Contact telephone and e-mail numbers:

(name) Matthew M. Stepien
(phone #) (804) 698-4026
(fax #) (804) 698-4234
(e-mail) mmstepien@deq.virginia.gov

FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK.